CLAIMS

1. A fixture for facilitating the fabrication of a fuel-cell membrane electrode assembly, the fixture comprising:

a plate having an aperture; and

means for mounting a gasket to the plate wherein the gasket at least partially obstructs the aperture;

wherein the portion of the gasket that at least partially obstructs the aperture provides a surface for mounting at least one electrode for a fuel-cell membrane electrode assembly.

2. The fixture as recited in claim 1, wherein the means for mounting the gasket to the plate comprises means for detachably mounting the gasket to the plate.

3. The fixture as recited in claim 1, wherein the means for mounting the gasket to the plate comprises at least one of mechanical means, adhesive means, magnetic means, and vacuum means.

4. The fixture as recited in claim 1, wherein the means for mounting the gasket to the plate comprises at least one magnet.

5. The fixture as recited in claim 4, wherein the means for mounting the gasket to the plate further comprises at least one ferro-magnetic plate mounted to the at least one magnet.

6. The fixture as recited in claim 4, wherein the fixture further comprises at least one vacuum aperture in the plate operatively connected to a source of vacuum.

7. The fixture as recited in claim 6, wherein the fixture further comprises at least one vacuum channel in fluid communication with the at least one vacuum aperture.

8. The fixture as recited in claim 1, wherein the plate comprises a plate having a thickness of less than about 0.25 inches.

9. The fixture as recited in claim 8, wherein the plate comprises at least one of a metallic and a non-metallic material.

10. The fixture as recited in claim 9, wherein the non-metallic material comprises a composite material.

11. The fixture as recited in claim 1, wherein the gasket comprises a thin-film gasket having a thickness less than about 500 microns.

12. A method for facilitating the fabrication of fuel-cell membrane electrode assemblies using a fixture comprising a first plate having an aperture, the method comprising;

a) providing a thin-film gasket;

b) mounting the thin-film gasket to the first plate wherein the thin-film gasket at least partially obstructs the aperture;

c) introducing an aperture to the thin-film gasket; and

d) mounting an electrode over the aperture in the thin-film gasket to provide a first gasketed electrode mounted in the first plate;

wherein the gasketed electrode is used in a fuel-cell membrane electrode assembly.

13. The method as recited in claim 12, wherein the first plate further comprises means for attaching the thin-film gasket to the first plate, and wherein b) mounting the thin-film gasket to the first plate comprises mounting the thin-film gasket using the means for attaching the thin film gasket to the first plate.

14. The method as recited in claim 12, wherein c) introducing an aperture in the thin-film gasket comprises introducing a quadrilateral aperture in the thin-film gasket.

15. The method as recited in claim 12, wherein c) introducing an aperture in the thin-film gasket comprises introducing a plurality of apertures in the thin-film gasket.

16. The method as recited in claim 12, wherein c) introducing an aperture in the thin-film gasket comprises die-cutting the aperture in the thin-film gasket.

17. The method as recited in claim 12, wherein d) mounting the electrode over the aperture in the thin-film gasket comprises d1) overlapping at least a portion of the electrode and the thin-film gasket, and d2) heating and compressing the overlapped portion to provide adhesion between the overlapped portion of the thin-film gasket and the overlapped portion of the electrode.

18. The method as recited in claim 17, wherein d2) heating and compressing comprises heating to at least about 100 degrees C and compressing to at least about 100 psi.

19. The method as recited in claim 12, further comprising repeating steps a) through d) to provide a second gasketed electrode mounted in a second plate.

20. The method as recited in claim 19, further comprising positioning an exchange membrane between the first gasketed electrode and the second gasketed electrode and sealing the first gasketed electrode and the second gasketed electrode about the exchange membrane to produce a sealed gasketed electrode-membrane-electrode assembly.

21. The method as recited in claim 20, wherein sealing comprises exposing the first gasketed electrode and the second gasketed electrode to temperature and pressure wherein the first gasketed electrode and the second gasketed electrode adhere to the exchange membrane.

22. The method as recited in claim 20, further comprising laminating the sealed gasketed electrode-membrane-electrode assembly.

23. The method as recited in claim 22, wherein laminating comprises exposing at least a portion of the gaskets of the first gasketed electrode and the second gasketed electrode to temperature and pressure wherein the portion of the gaskets adhere to each other.

24. The method of claim 20 further comprising introducing at least one aperture to the gasket of the sealed gasketed electrode-membrane-electrode assembly to provide a passage for a gas when assembled in a fuel cell stack.

25. The method of claim 20 further comprising positioning the sealed gasketed electrode-membrane-electrode assembly in a fuel cell stack.

26. A fixture for facilitating the fabrication of devices having thin films, the fixture comprising:

a plate having an aperture; and

means for mounting a thin film to the plate wherein the thin film at least partially obstructs the aperture;

wherein the portion of the thin film that at least partially obstructs the aperture provides a surface for mounting at least one component of the device.

27. The fixture as recited in claim 26, wherein the means for mounting the thin film to the plate comprises means for detachably mounting the thin film to the plate.

28. The fixture as recited in claim 26, wherein the means mounting the thin film to the plate comprises at least one of mechanical means, magnetic means, and vacuum means.

29. The fixture as recited in claim 26, wherein the means for mounting the thin film to the plate comprises at least one magnet.

30. The fixture as recited in claim 29, wherein the means for mounting the thin film to the plate further comprises at least one ferro-magnetic plate mounted to the at least one magnet.

31. The fixture as recited in claim 29, wherein the fixture further comprises at least one vacuum aperture in the plate operatively connected to a source of vacuum.

32. The fixture as recited in claim 31, wherein the fixture further comprises at least one vacuum channel in fluid communication with the at least one vacuum aperture.

33. The fixture as recited in claim 26, wherein the plate comprises a plate having a thickness of less than about 0.25 inches.

34. The fixture as recited in claim 33, wherein the plate comprises at least one of a metallic and a non-metallic material.

35. The fixture as recited in claim 34, wherein the non-metallic material comprises a composite material.

36. The fixture as recited in claim 26, wherein the thin film comprises a thin-film having a thickness less than about 500 microns.

37. A method for facilitating the fabrication of devices having thin films using a fixture comprising a plate having an aperture, the method comprising;

a) providing the thin film;

b) mounting the thin-film to the plate wherein the thin film at least partially obstructs the aperture;

c) mounting at least one component of the device on the thin film to provide a component with a thin film supported by the plate;

d) exposing the component with a thin film to further processing while supported by the plate; and

e) mounting the component with the thin film in the device.

38. The method as recited in claim 37, further comprising f) introducing at least one aperture to the thin film.

39. The method as recited in claim 37, wherein the plate further comprises means for attaching the thin film to the plate, and wherein b) mounting the thin film to

the plate comprises mounting the thin film using the means for attaching the thin film to the plate.

40. The method as recited in claim 37, wherein the plate further comprises at least one magnet, and wherein b) mounting the thin film to the plate comprises positioning the thin film over the at least one magnet and placing a ferro-magnet plate over the thin film and the at least one magnet.

41. The method as recited in claim 37, wherein c) mounting at least one component of the device on the thin film comprises c1) overlapping at least a portion of the component and the thin-film, and c2) heating and compressing the overlapped portion to provide adhesion between the overlapped portion of the thin-film and the overlapped portion of the component.

42. The method as recited in claim 41, wherein c2) heating and compressing comprises heating to at least about 100 degrees C and compressing to at least about 100 psi.